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SPECIFICATION

Carburettor with air filter for an internal combustion engine

1 The invention relates to carburettors for internal
 5 combustion engines of the type comprising a float chamber and a circuit for feeding fuel from said float chamber to an induction passage formed in the body of the carburettor, said circuit opening into said induction passage upstream of an
 10 operator operable member and downstream of an air intake having an air filter whose housing is fixed to the carburettor body.

Such carburettors are frequently formed from cast parts assembled together by screws; in a
 15 conventional downdraft carburettor, the body of the carburettor comprises successively, from downstream to upstream in the airflow direction:

— a first pipe defining a portion of the induction passage and carrying the throttle
 20 member (or butterfly valve) of the carburettor and its control lever;
 — a second part in which are formed the float chamber and the portion of the intake pipe into which the main fuel jet system opens. In this part
 25 are to be found the main elements of the air and fuel circuits which supply the air/fuel mixture required for proper operation of the engine. In some carburettors, the second and the first parts for a single cast part;
 30 — finally, a third cast part, generally called "chamber top" which forms a lid for the float chamber and is formed with a portion of the induction passage forming the air intake of the carburettor; that fraction usually locates a starting
 35 valve which comes into action when the engine is started from cold.

The housing of the air filter protecting the air intake of the carburettor is mounted on this assembly. For the filter and its housing to be
 40 rigidly fixed, it is necessary to provide the chamber top of the carburettor with a set of threaded rods and passages and even intermediate adapter parts.

This connection between the carburettor and
 45 the assembly protecting its air intake is complex and consequently costly; moreover, it decreases the strength of the chamber top of the carburettor.

It is an object of the present invention to remove these disadvantages and to reduce the
 50 cost of the assembly formed by the carburettor and the air filter.

According to the invention, there is provided a carburettor of the above type in which the lower part at least of the air filter housing is integral with
 55 a portion of the body of the carburettor, which will typically be the above-defined chamber top, to constitute a sub-assembly.

The sub-assembly is made from injection-moulded plastics material; it may be secured directly to the casting of the carburettor by
 60 screws. It advantageously carries the operational elements of the float chamber which are found on conventional "chamber tops", i.e. the fuel intake to the carburettor (comprising the inlet needle

65 valve) and the support of the float which controls the fuel level.

The invention will be better understood from the following description of particular embodiments given by way of examples only. The description refers to the accompanying drawings in which:

70 Figure 1 is a schematic view in vertical cross-section of a downdraft-type carburettor in accordance with the invention;

75 Figure 2 is a schematic view in vertical cross-section of a detail of a modified embodiment, which renders fitting (or removal) of the carburettor on an engine easier.

80 Referring to Figure 1, the main components of a carburettor are illustrated and comprise a body in which is formed an induction passage or intake pipe 1. In pipe 1, there are placed, from downstream to upstream in the air flow direction: an operator operable throttle member 2; a main

85 venturi 3 into which opens a fuel jet system supplied by a float chamber 4 and an auxiliary throttle member which, in the embodiment illustrated, is an eccentrically mounted butterfly valve 11 carried by a shaft and associated with

90 manual or automatic means (not shown) adapted to close it all the more the colder the engine supplied by the carburettor. The float chamber 4 contains a float 5 actuating the closure needle 15 of a fuel intake valve so as to maintain the free
 95 surface of the fuel in tank 4 substantially at a predetermined level N.

The main jet system comprises a well 8 supplied with fuel from the float chamber 4 through a main jet 9; a tube 13 having perforations in its lower part dipping into bore 8 so as to introduce therein air from the air intake 10 of the carburettor, arriving through a channel having a calibrated orifice 12; and a channel 7 through which the air-fuel mixture from the upper part of bore 8 flows to a jetting orifice 14 placed inside an auxiliary venturi 6.

The components which have been described are protected by a chamber top forming a lid for the float chamber 4 and connecting the air intake
 100 10 of the intake pipe to an air filter chamber.

In the carburettor shown in Figure 1, the chamber top is formed by a part 20 which also forms the lower part of the housing containing the air filter 21. Part 20 is moulded from plastics

115 material. It is securely connected to the rest of the body of the carburettor, formed by a light alloy cast part, by screws 22. A flat seal 23 is placed between part 20 and cast part 43. The housing of the air filter comprises, in addition to part 20, a dish-shaped lid 24 formed, at its periphery, with the carburettor air intake (not shown). The filtering element 20, annular in shape, is conventionally retained between part 20 and lid 24. The lid 24 is

120 fixed by a nut 25 screwed onto a threaded rod 26 fast with the cast part.

125 Part 20 has a projecting portion for closing the float chamber. The projecting portion is provided with a fuel intake connection 30, in which is formed a channel 31. The channel 31 opens into a

chamber 32 locating a fuel filter 33. The chamber opens downwards through a threaded passage 34 into which the body 35 of the needle valve 15 is screwed.

5 The projecting portion is provided with a lug 20a which supports the horizontal shaft 40 about which float 5 may rotate. Thus, the float and the needle valve are positioned with respect to each other with all the accuracy allowed by the

10 moulding apparatus.

The projecting portion has a through-hole 36 connecting the top part of the float chamber 4 to the inside of the filtering element 21 so as to establish a pressure close to atmospheric pressure

15 above the free level N.

It can be seen that the assembly formed by the body of the carburettor and the housing of the air filter is very simple in construction. Only the lower fraction of the body of the carburettor must be

20 cast, then machined, either as a single part 43 (as illustrated in Figure 1), or in two parts (if an independent butterfly valve support is desired, which may be separated from the portion locating the air and fuel circuits by a heat-insulating joint).

25 Despite the simplification, the assembly has a high degree of structural strength the butterfly valve and its shaft being integrated in the cast part. The use of a plastics material chamber top reduces the cost, for injection-moulding allows a finished part

30 to be obtained requiring no further machining.

The assembly is extremely compact, resulting in an appreciable gain in space under the bonnet of a motor vehicle.

So as to allow carburettor removal without

35 having to remove beforehand the air filter, there may be provided, in the housing thereof, chimneys with a substantially vertical axis, facing passages which receive the screws for fixing the body of the carburettor to the engine. Such passages must be

40 offset angularly with respect to the passages receiving the screws 22. The chimneys may be formed by tubular extensions 50 of lid 24 cooperating with annular flanges 51 of part 20, as shown in Figure 2. Air leaks through the chimneys

45 are avoided by placing an O-ring seal 52 between the end-face of extensions 50 and the bottom of an extension-receiving groove cut out in flanges

51. Tools, such as box or socket spanners or screwdrivers, may be introduced through the chimneys for removing the nuts or screws fixing the foot of the carburettor to the manifold of the engine.

The invention is not limited to the embodiments given by way of examples and it is susceptible of numerous variations, particularly in being adaptable to the case of horizontal carburettors or constant-depression carburettors also called variable-choke carburettors.

CLAIMS

- 60 1. A carburettor for an internal combustion engine comprising a float chamber and a circuit for feeding fuel from the float chamber to an induction passage formed in the body of the carburettor, said circuit opening into said induction passage upstream of an operator operable throttle member downstream of an air intake fitted with an air filter whose housing is fixed to the carburettor body, wherein the lower part at least of the air filter housing is integral with a portion of the body of the carburettor.
- 65 2. Carburettor as claimed in claim 1, wherein said lower part and said portion constitutes a sub-assembly of moulded plastics material which carries a fuel inlet control valve of said float chamber and a float controlling said valve and which forms a float chamber top.
- 70 3. Carburettor as claimed in claim 1 or 2, wherein said lower part and portion are fixed by screws to the rest of the body of the carburettor, made from cast alloy.
- 75 4. Carburettor as claimed in any one of claims 1 to 3, wherein the air filter housing is provided with a lid fixed to a threaded rod fast with the rest of the body of the carburettor.
- 80 5. Carburettor as claimed in claim 4, wherein the air filter housing comprises chimneys parallel to the flow direction of the air in the induction passage, providing access to screws for securing the carburettor body to an associated engine.
- 85 6. Carburettor as claimed in claim 1, substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.